Engineered by

APC by Schneider Electric

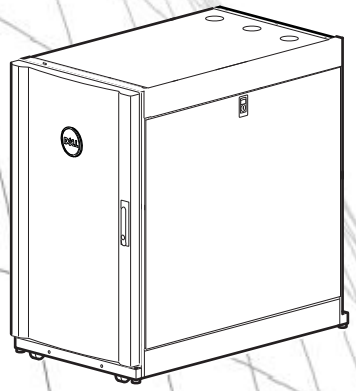
for

DELL

Installation and Customization

NetShelter™ SX 24U Cabinet

AR3104X717



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Introduction

The APC by Schneider Electric NetShelter SX 600 mm (23.6 in.) wide, 24U cabinet is a high-quality cabinet for storage of industry-standard (EIA-310), 19 in. rack-mount hardware, which includes servers and voice, data, networking, internetworking, and power protection equipment.

This manual covers the following NetShelter SX cabinet:

Model	Rack Mounting Height	Rack Mounting Width	External Cabinet Width	Cabinet Depth
AR3104X717	24U*	482 mm (18.98 in.)	600 mm (23.62 in.)	1070 mm (42.13 in.)

*1U= 44.45 mm (1.75 in.)

Unpack the Cabinet

Disclaimer

APC by Schneider Electric is not responsible for damage sustained during reshipment of this product.

Inspection

Inspect the packaging and contents for shipping damage. Make sure that all parts are accounted for. Report any damage immediately to the shipping agent. Report missing contents, damage, or other problems immediately to APC by Schneider Electric or your reseller.

Please Recycle

The shipping materials are recyclable. Save them for later use, or dispose of them appropriately.

Important Safety Information

Read the instructions carefully to become familiar with the device before trying to install, operate, service or maintain it. The following messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

CAUTION

CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Safety Instructions

This manual contains important instructions that must be followed during the installation and customization of the cabinet.

⚠WARNING

TIP HAZARD

- This cabinet is easily tipped. Use extreme caution when unpacking or moving.
- Use at least two people to unpack and move the cabinet.
- Before moving the cabinet on its casters, load 158 kg (350 lb) of equipment into the bottom of the cabinet for extra stability.
- When moving on its casters, make sure the leveling feet are up and push the cabinet from the front or rear.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

HEAVY EQUIPMENT

Use at least two people to unpack the cabinet.

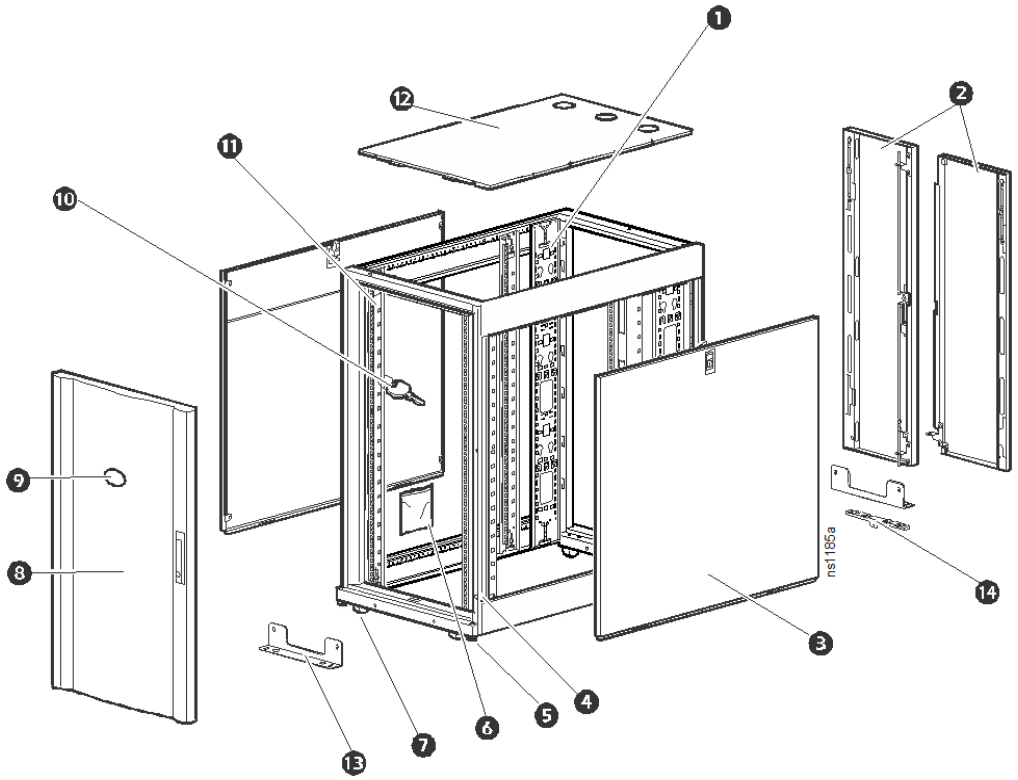
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Labels

Look for additional safety information affixed to the cabinet. See “Labels” on page 6 for more information.

Component Identification

Cabinet



❶ Adjustable vertical 0U accessory channel

❷ Removable rear split doors

❸ Removable side panels with locks

❹ Cabinet frame

❺ Adjustable leveling feet

❻ Hardware bag (see page 5)

❼ Casters

❽ Removable and reversible front door

❾ Nameplate (if equipped)

❿ Key for doors and side panels

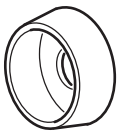
⓫ Vertical mounting flanges

⓬ 1070 mm (42.13 in.) roof

⓭ Bolt-down bracket

⓮ Rear door cable containment bracket

Hardware Bag



Plastic cup washer (60)

M6 x 16 Phillips slot screw (60)

M5 x 12 screw (4)

Cage nut (60)

7 mm (0.28 in.) hole plug (4)

Tools (provided)

TORX® T30/#2 Phillips tool

Cage nut tool (1)

Cabinet Installation

Move the Cabinet

⚠WARNING

TIP HAZARD

- This cabinet is easily tipped. Use extreme caution when unpacking or moving.
- Use at least two people to unpack and move the cabinet.
- Before moving the cabinet on its casters, load 158 kg (350 lb) of equipment into the bottom of the cabinet for extra stability.
- When moving on its casters, make sure the leveling feet are up and push the cabinet from the front or rear.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

❶

❷

Labels. The following labels can be found on the cabinet, and serve to communicate the following information:

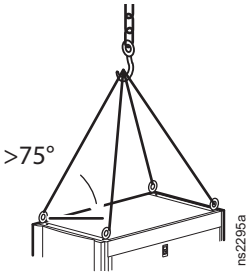
Label ❶: Generic Tip Hazard

Label ❷: Extend Slide-Mounted Hardware One Piece at a Time

Casters. The cabinet can be moved on its casters with up to 1020 kg (2,250 lb) of equipment installed. Once in place, lower the leveling feet. With the leveling feet lowered, the static cabinet can be loaded to 1364 kg (3,000 lb).

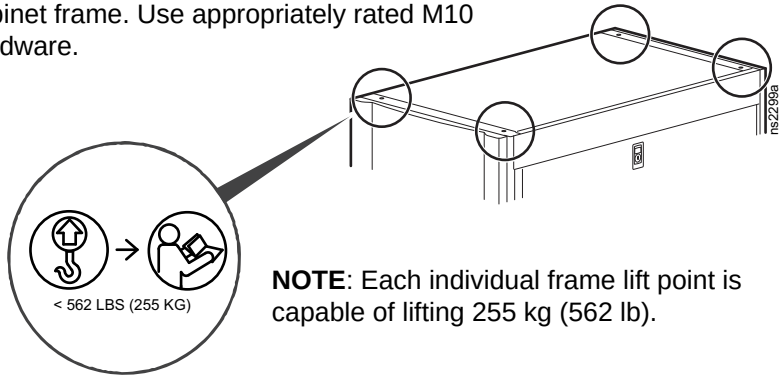
NOTE: Some labels on cabinet indicate caster related information. See label ❸ to right.

❸



NOTE: If using supplemental lifting hardware, ensure the load angle is a minimum of a 75°.

Lifting Points. The cabinet can be lifted by removing the hole plugs and attaching appropriate hardware (not included), to the top of the cabinet frame. Use appropriately rated M10 hardware.



NOTE: Each individual frame lift point is capable of lifting 255 kg (562 lb).

⚠WARNING

HEAVY EQUIPMENT

- Cabinet should only be moved by a qualified person.
- Verify total weight. Never exceed loading capacity specified by the hardware ratings.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

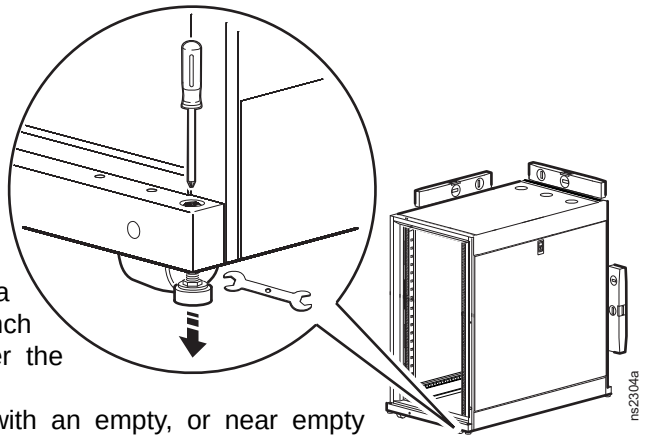
Level the Equipment

NOTE: The leveling feet at the corners of the equipment provide a stable base if the floor is uneven, but they cannot compensate for a badly sloped surface.

1. Ensure the cabinet is in its intended location. Remove the front and rear doors.
   See “Removal” on page 9 for instruction.

   NOTE: Before removing the front door, unplug the ground wires and any other wire connections that may interfere with the removal of the doors.

2. Insert a Phillips head screwdriver into the screw above the leveling foot. Turn the screw clockwise to extend the leveling foot until it makes firm contact with the floor.



NOTES:
1. If loaded with equipment, a 13 mm open ended wrench can also be used to lower the leveling feet.
2. This method works best with an empty, or near empty cabinet.
3. Door removal is not required if using the 13 mm open-ended wrench.

3. Adjust each foot and, using a level, adjust the feet until the cabinet is level and plumb.
4. Install the front and rear doors.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK
When Installing the doors, remember to reconnect all ground and other connection wires.
Failure to follow these instructions will result in death or serious injury.

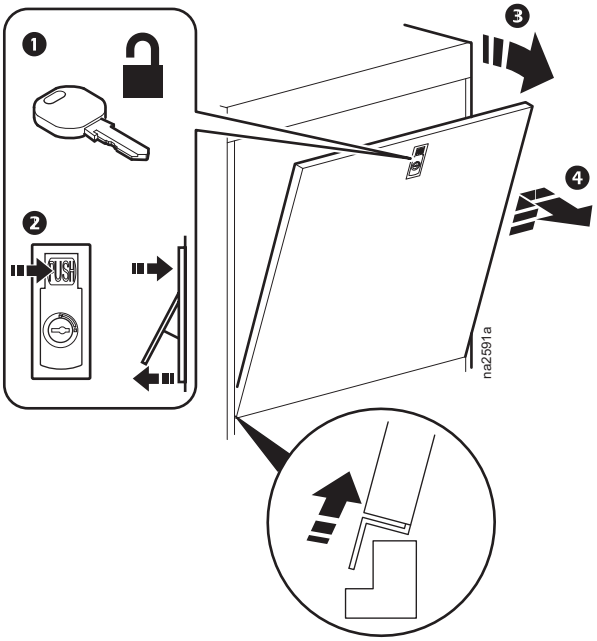
Remove the Casters and Leveling Feet (optional)

1. Lay the cabinet on its side.
2. Using a 10 mm socket wrench (not provided), remove the four hex nuts from each of the casters and remove the casters.
3. For each leveling foot, use a Phillips screwdriver to turn the foot clockwise until it is released from the frame.

NOTE: Remove all equipment from the cabinet before removing casters and leveling feet.

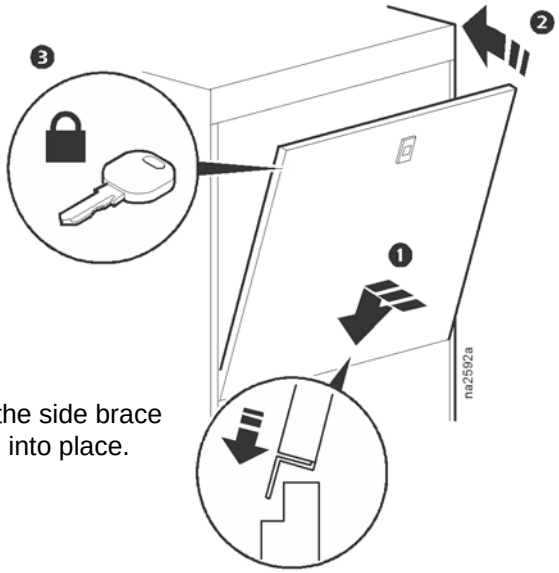
Side Panels, Roof, and Doors

Side Panels



Removal

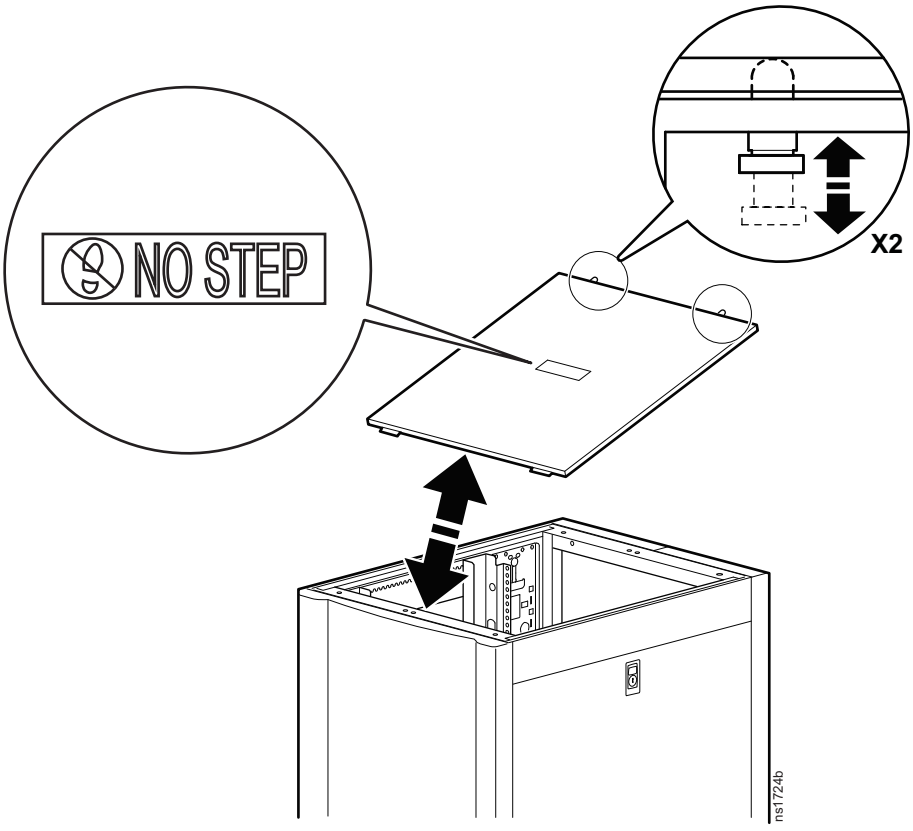
1. Use the key to unlock the panel, if necessary.
2. Push the panel latch in at the top of the handle where indicated, and pull the bottom of the latch away from the cabinet.
3. Lift the panel up and off the side brace lip at the bottom of the panel frame.



Installation

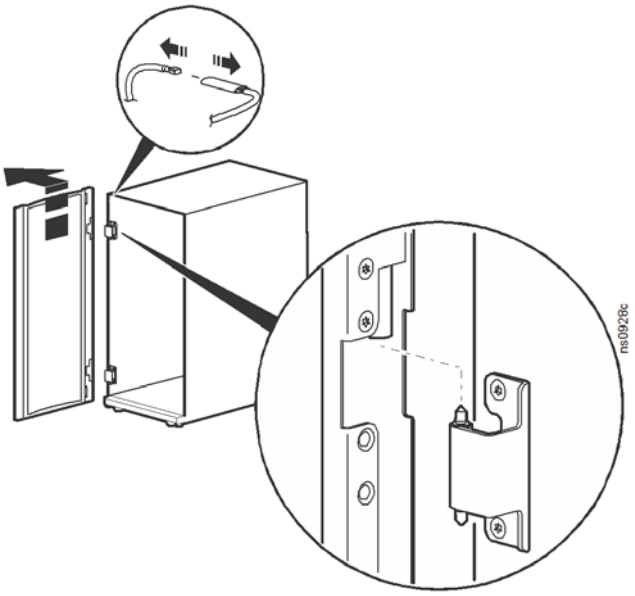
1. Engage the bottom of the panel securely with the side brace lip before pushing the top of the panel forward into place.
2. Use the key to lock the panel, if necessary.

Roof



Door

Removal

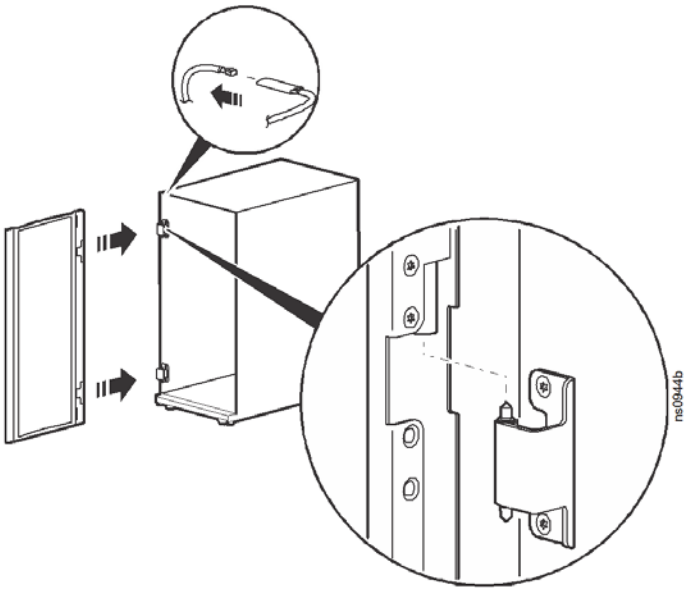


1. Unlock the cabinet front door handle and open the door.

2. Disconnect the ground wire and any other wire connections that may interfere with the removal of the doors.

3. The hinges come apart by lifting upward and outward. Slowly lift and pull the door from the cabinet until the hinge pins on the door are free of the hinges on the cabinet frame.

Installation



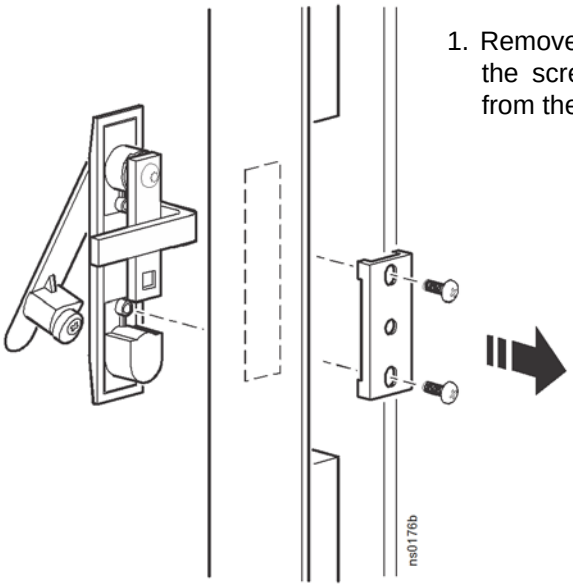
1. The doors self-align on hinge pins when properly installed. With the door at a 90 degree angle to the front of the cabinet, position the door over the hinge pins.

2. Slowly lower the door into the cabinet frame ensuring that the door hinges correctly align to the cabinet frame hinges.

3. Connect the ground wire and any other wire connections. Make sure the door opens and closes properly.

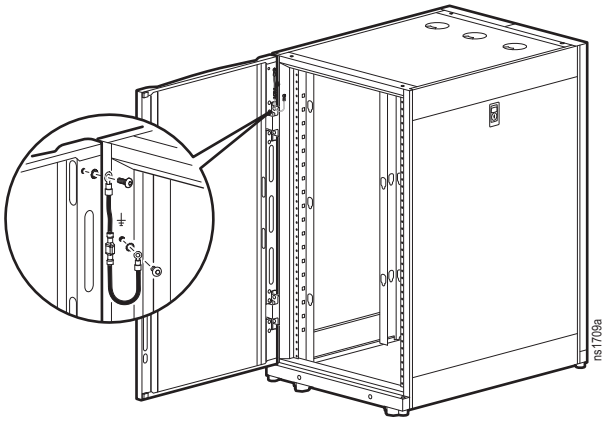
Reverse the Front Door

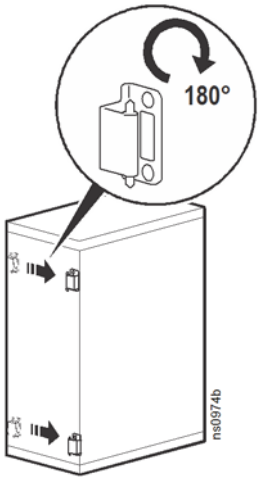
NOTE: The front door can be reversed so that the door opens in the other direction. This procedure assumes that initially, when facing the cabinet, the hinges are on the left and the door is opening from right.



1. Remove the handle by removing the screw-plate. Pull the handle from the door.

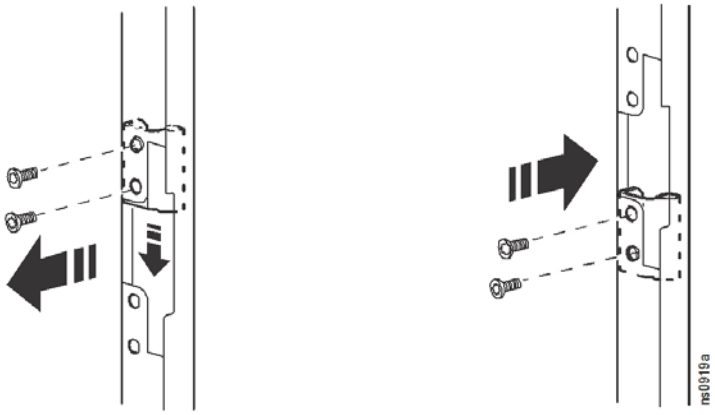
2. Disconnect the ground wire, and any other wire connections. Remove the door from the frame. See “Removal” on page 9 for more information.



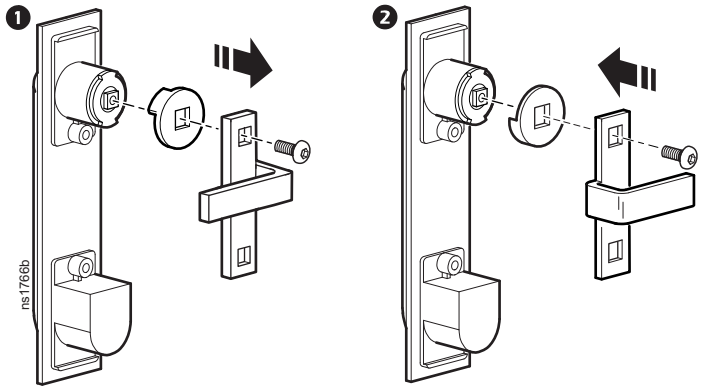


3. Locate the upper hinge on the cabinet frame. Remove the two screws holding the hinge in place. Install the hinge onto the other side of the cabinet frame. Repeat this step for the lower hinge.

4. Remove the hinges from the door and install them using the set of holes directly below where they were originally installed. Rotate the door 180 degrees and install on cabinet



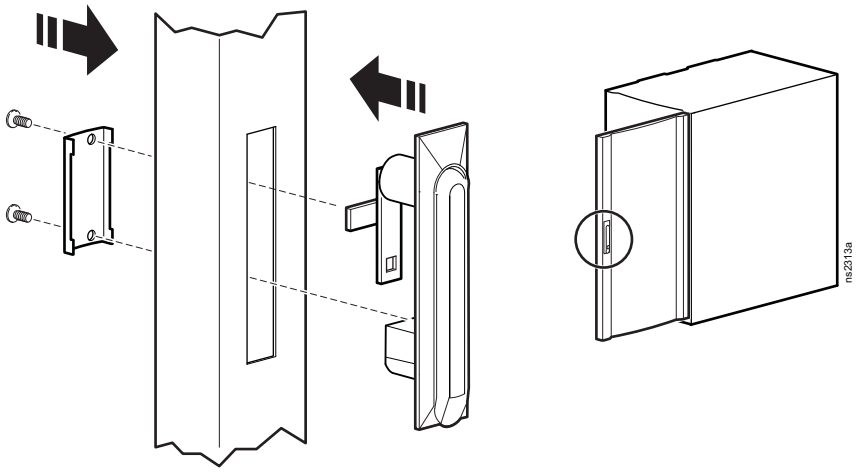
5. Install the door to the hinges now on the reverse side of the cabinet frame. See “Installation” on page 9 for instruction. Connect the ground wire and any other wire connections previously disconnected.



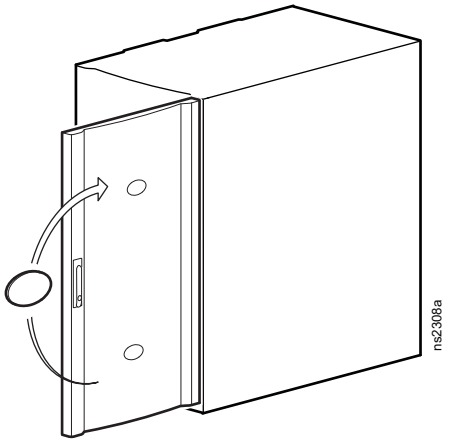
6. Locate the lock handle.

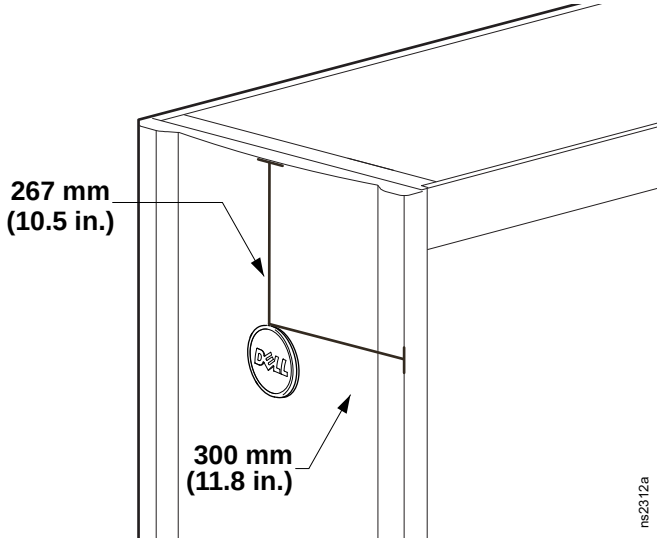
   Remove the cam screw, cam washer, and cam. Rotate the cam washer 90 degrees, and the latch 180 degrees.

   Install the handle on the door.



7. Remove the nameplate (if equipped) from the door. Install the nameplate at the location shown in the illustrations below.





Equipment Installation

NOTE: NetShelter SX cabinets are intended for use with Listed equipment. If you install un-Listed equipment, you should evaluate the safety of your configuration.

⚠WARNING

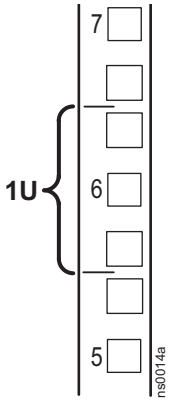
TIP HAZARD

- This cabinet is easily tipped. Make sure you have secured the cabinet to the floor before installing equipment.
- Install the heaviest equipment first and toward the bottom of the cabinet to prevent the cabinet from becoming top-heavy.
- Do not extend equipment on sliding rails until you have installed 158 kg (350 lb) of equipment into the bottom of the cabinet for stability or until you have installed the stabilizer plate or bolt-down brackets. Do not extend more than one piece of equipment on sliding rails at a time.

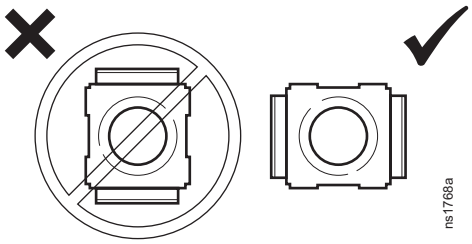
Failure to follow these instructions can result in death, serious injury, or equipment damage.

To Install Rack-mount Equipment in the Cabinet:

1. Review the equipment manufacturer's installation instructions.
2. Locate the top and bottom U-space on the vertical mounting rails. Every third hole on the mounting rails is numbered to indicate the middle of a U-space.
3. Install the cage nuts on the interior of the vertical mounting rail; then install the equipment. (To remove a cage nut, squeeze the sides to release it from the square hole.)



Cage Nuts



APC by Schneider Electric offers a cage nut hardware kit (AR8100) for use with square holes.

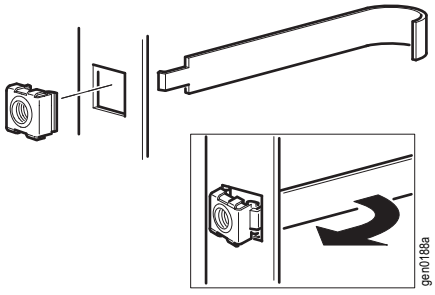
NOTE: Install cage nuts horizontally, with the ears engaging the sides of the square hole. Do NOT install cage nuts vertically with the ears engaging the top and bottom of the square hole.

Installation

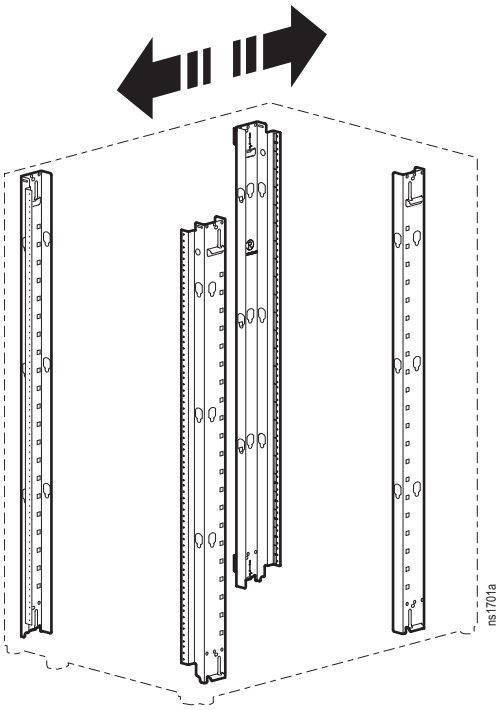
1. Insert the cage nut into the square hole by hooking one ear of the cage nut assembly through the far side of the hole.
   NOTE: Install the cage nuts on the interior of the vertical mounting flange.
2. Place the cage nut tool on the other side of the cage nut and pull to snap it into position.

Removal

1. Remove any attached screw.
2. Grasp the cage nut and squeeze the sides to release it from the square hole.



Vertical Mounting Flanges



Vertical mounting flanges come factory-installed at 737 mm (29 in.), the proper location for use with rack-mountable equipment.

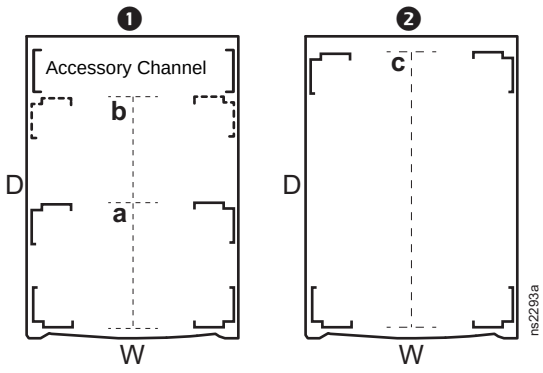
The mounting flanges are adjustable towards the front or the rear of the cabinet to accommodate different rails or equipment with other depths.

For Dell™ cabinets, such as AR3100X717 and AR3104X717, the vertical mount flanges may be secured in place with additional screws.

To adjust the flanges, these screws must be removed. After adjustment, ensure all of the removed screws are secure and once again installed properly. If the rack will be shipped with equipment loaded inside, all screws must be secured. Four screws secure each of the four vertical mount flanges in the AR3104X717.

Position the Vertical Mounting Flanges

- Configuration ❶: The Accessory Channel is installed. The Vertical Mounting Flanges can be installed a minimum distance of (**a**) and can extend as far as (**b**).
- Configuration ❷: The Accessory Channel is removed. The Vertical Mounting Flanges can extend as far as (**c**).



Top View

Models	Cabinet Width (W)	Cabinet Depth (D)	a	b	c
AR3104X717	600 mm	1070 mm	190.5 mm (7.5 in.)	781.0 mm (30.75 in.)	920.7 mm (36.25 in.)

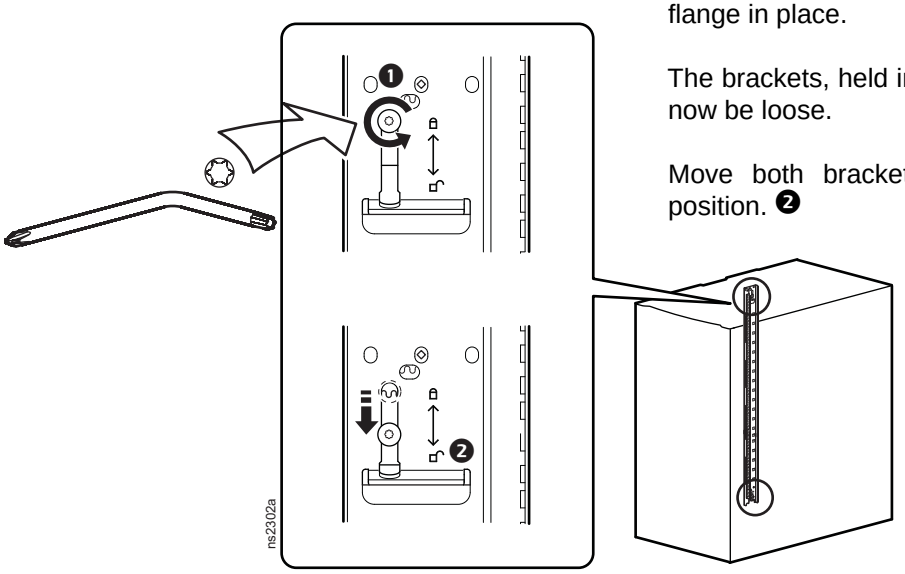
Vertical Mounting Flange Adjustment

⚠WARNING

FALLING EQUIPMENT

Remove all equipment installed on the vertical mounting flanges before performing any adjustments.

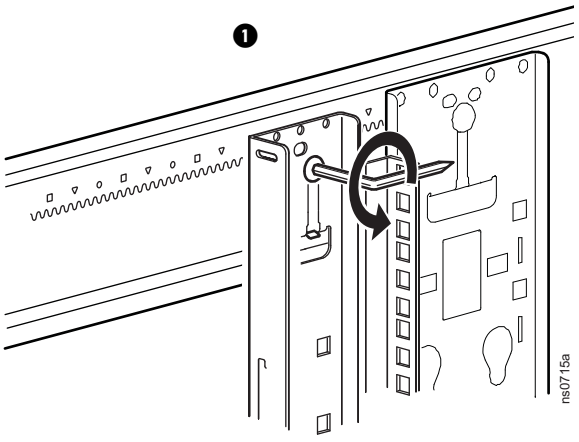
Failure to follow these instructions can result in serious injury or equipment damage.

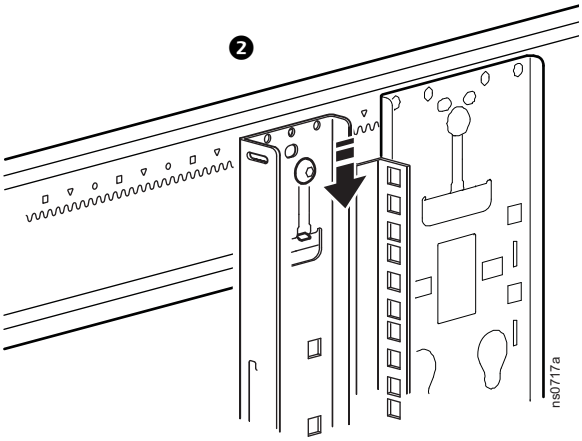


1. Use the provided TORX T30 tool to loosen the top and bottom TORX screws ❶ holding the vertical mounting flange in place.

   The brackets, held in place by the TORX screws, will now be loose.

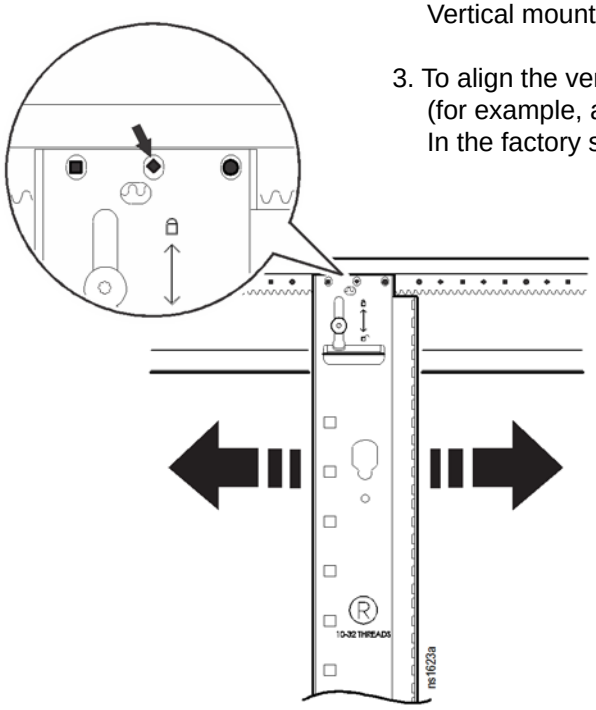
   Move both brackets to the designated unlocked position. ❷



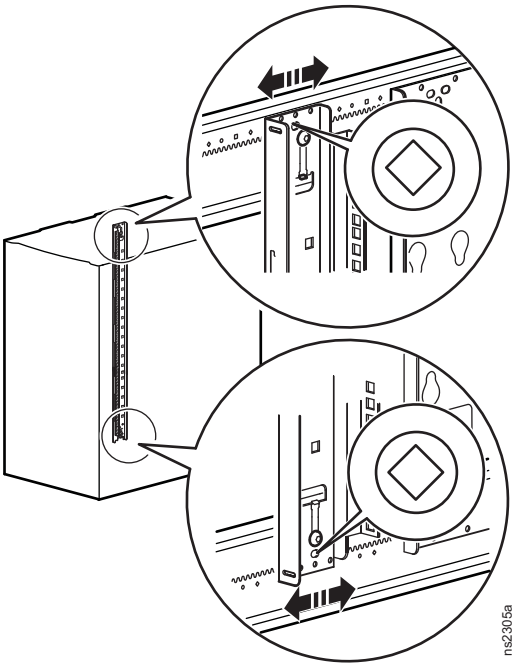


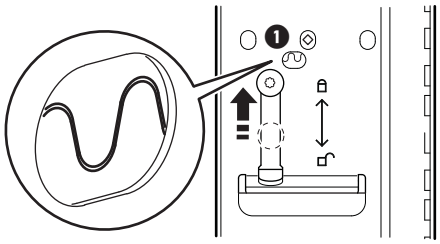
2. Move the mounting flange to the desired location.
   Vertical mounting flanges adjust in 6 mm (1/4 in.) increments.

3. To align the vertical mounting flange, note the symbol (for example, a diamond). Only one symbol will be visible. In the factory standard position, a circle symbol is visible.



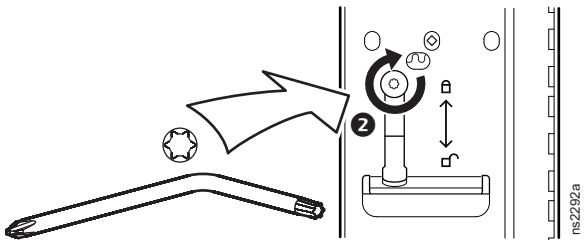
Make sure the same symbol is visible through the corresponding hole at both the top and the bottom of the flange.





4. When the vertical mounting flange is in the desired location at the top and bottom, raise the flat bracket to the lock position. The teeth in the bracket will engage fully with the teeth in the side brace. ❶

   Tighten the TORX screws. ❷



Secure the Cabinet

⚠ WARNING

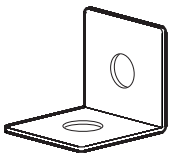
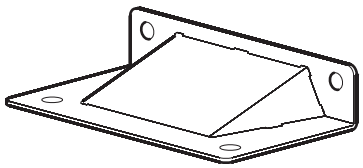
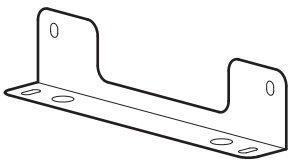
TIP HAZARD

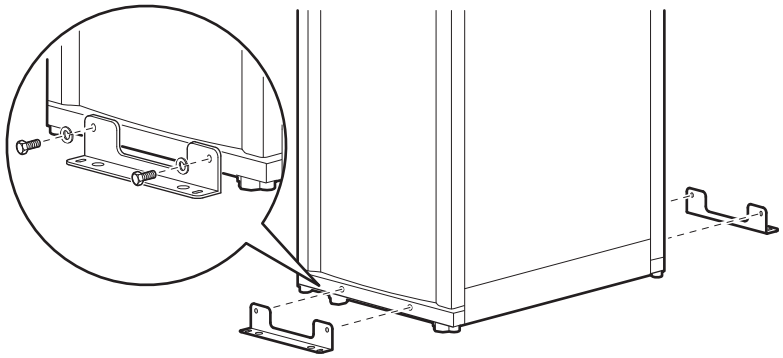
Make sure you secure the cabinet to the floor before installing equipment.

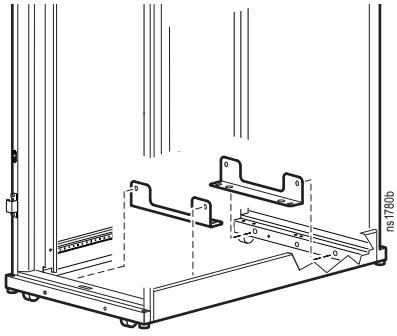
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Brackets can be used to bolt the cabinet to the floor internally or externally. Some options for providing additional stabilization are shown below. See **www.apc.com** for bracket installation support and more information.

NOTE: Only use the bolt-down bracket or stabilization plate with the casters or leveling feet installed.

Accessory	Part Number	Description	
Bolt-down kit	AR7701	Attaches to rack and floor internally or externally to provide additional stability without blocking cable access.	
NetShelter SX Stabilizer Plate	AR7700	Attaches externally to the rack and floor to provide additional stability.	
Pallet / Bolt-down Brackets	provided with the cabinet	Attaches to the rack, internally or externally, to secure the rack to the floor. This provides additional stability without blocking cable access. With the appropriate mounting hardware, meets IBC/CBC seismic requirements.	



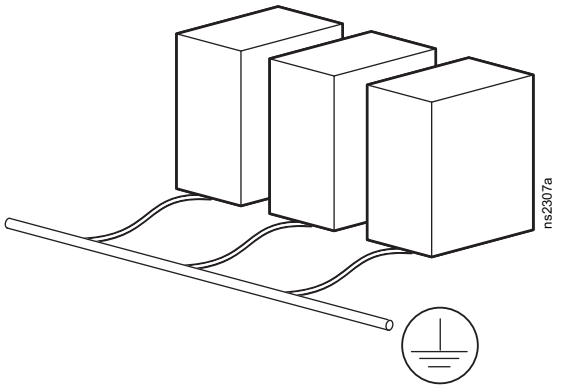


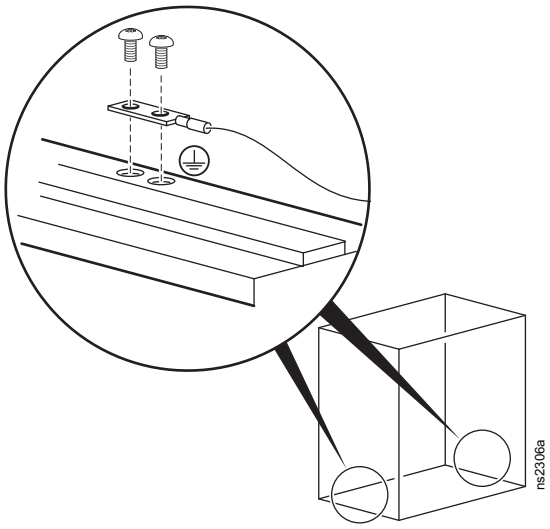
Ground the Cabinet

The doors, side panels, and roof of the cabinet are grounded to the cabinet frame. The doors are grounded with quick-disconnect cables. The roof and side panels are inherently grounded through spring fingers.

Each cabinet should be bonded directly to a common ground using one of the designated grounding locations (two M6 threaded inserts) at the top or bottom of the cabinet.

- Use a Common Bonding Network Jumper kit (for example, Listed [KDER] Panduit® RGCBNJ660PY or equivalent).
- Use paint-piercing washers between the ground terminal and the cabinet frame, or remove the paint on the frame under the ground terminals, per NEC NFPA 70 Article 250.12.
- Torque the screws to 6.9 N•m (60 lb-in).
- Do not ground one cabinet to another cabinet in a cascading style. Ground each cabinet directly to the building ground.





⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK

Connection of the cabinet to building Common Bonding Network (CBN) is required.

Failure to follow these instructions will result in death or serious injury.

Cable Management

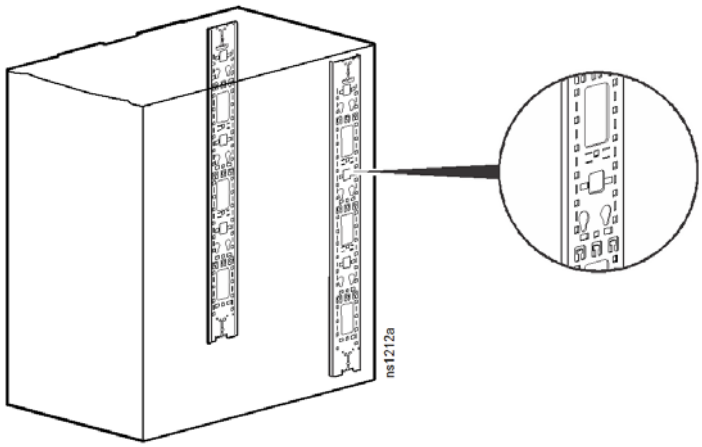
The NetShelter SX cabinet has multiple cable access openings, including on the roof, sides, and bottom. Route, secure, and organize cables using these openings.

In addition, two rear vertical 0U cable organizers, or accessory channels, are included with the cabinet. Further cable management accessories are available. Please see **www.apc.com** or contact an APC by Schneider Electric re-seller for more information.

Accessory Channel

The accessory channels provide toolless mounting capabilities for Rack Power Distribution Units and cable management accessories.

There are two accessory channels included with the 1070 mm (47.24 in.) deep cabinet. The factory-default position for the accessory channels is in the rear of the cabinet, as shown in the graphic.



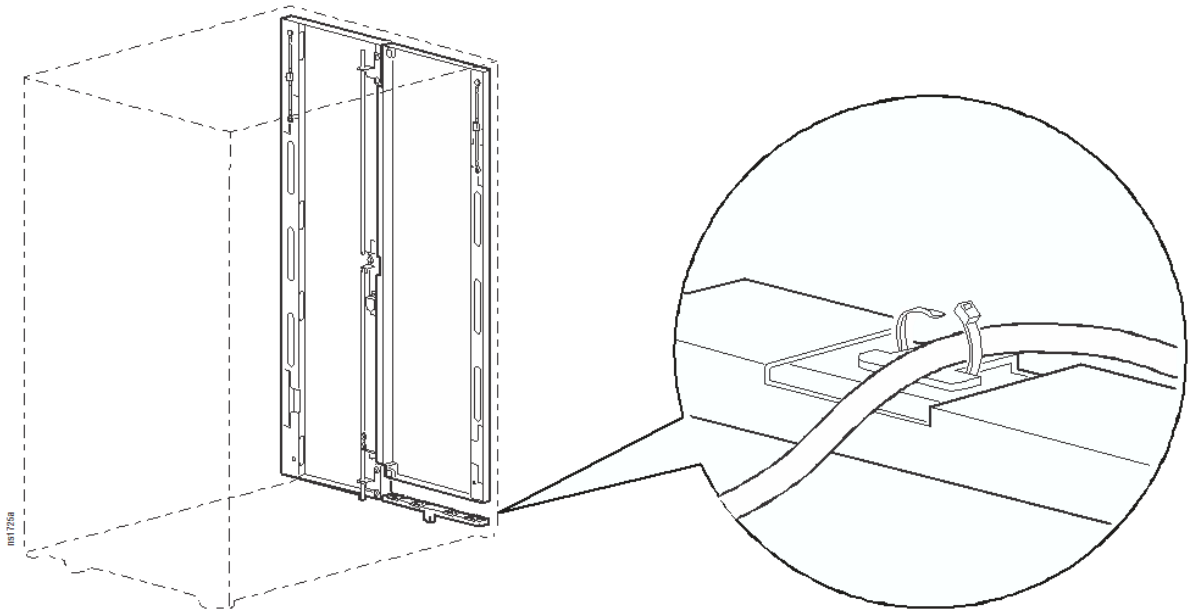
The channels also provide tie-off locations for cables, as well as other specific holes for managing cables with many NetShelter brackets, fasteners, and toolless mounting equipment.

Similar to the mounting flanges, the accessory channel can be moved anywhere along the side braces. See “Vertical Mounting Flanges” on page 13 for more information.

NOTE: If needed, the accessory channels can be removed. Additional vertical 0U accessory channels are available for order.

Rear Door Cable Containment Bracket

The rear door cable containment bracket is installed within the cabinet under the left hand door. The bracket has 4 lobes for attaching cables with hook-and-loop fasteners (provided) and cable ties (not provided).



Specifications

24U Cabinet

AR3104X717

Height	1199 mm (47.20 in.)
Width	600 mm (23.62 in.)
Depth	1070 mm (42.13 in.)
Net weight	88.90 kg (196.00 lb)
Total open area (front door)	345 808 mm^2 (536.00 in^2)
Total open area (rear door)	375 870 mm^2 (582.60 in^2)
Open area per U (front door)	14 406 mm^2 (22.33 in^2)
Open area per U (rear door)	15 658 mm^2 (24.27 in^2)
Perforation pattern open area	69%
Percent open (front)	67%
Percent open (rear)	73%
Clearance*	60.96 mm (2.40 in.)
** wiring between front door and vertical rail*	
Weight rating: static load [1]	1363.6 kg (3,006 lb)
Weight rating: rolling	1022.7 kg (2,255 lb)
Weight rating: shipping [2]	567 kg (1,250 lb)

[1] Lower the leveling feet if the static weight is over 1022.7 kg (2,255 lb).

[2] **NOTE:** Additional packaging is required if the rack is being shipped with equipment installed. Please discuss packaging requirements with your Dell representative.

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